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ABSTRACT

With the implementation of an open admissions policy in 1970-71, Bronx Community College undertook a study of students entering in the fall of 1970 to determine changes in levels of academic preparation, trends in attrition and retention for students differentially prepared for college work, identification of entry variables associated with dropping out or continuing successfully, and the rate and pattern of progress for different groups of students. At the beginning of the spring semester of 1970-71, freshmen who did not return were compared with those who returned on a number of variables, including high school average, high school curriculum, reading score, type of high school attended, and admissions classification (would have been rejected in 1969 for inadequate high school average, would have been rejected for subject-matter insufficiencies, or would have met 1969 requirements). The most important finding is the apparent absence of clear or strong relationships between the entry variables and the tendency to drop out after one semester. This is indicated despite the relationships linking high school mathematics (amount and proficiency) and the type of high school to the dropout rate. The open-admissions student does not show a significantly higher dropout rate than the "fully qualified" student. A replication of this study covering an entire academic year is recommended, as well as studies of the influence of non-scholastic factors on the tendency to drop out. (KM)

Dropout Prediction at an Urban Community College following Open Admissions

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Introduction

With the implementation of an Open Admissions policy, Bronx Community College, as all the other units of the City University, was faced with the challenge of guaranteeing that the passage of students through the college did not assume the nature of a "revolving door".

It was essential, therefore, that the background and experiences of the students entering B.C.C. in the Fall of 1970 be examined for any light which could be thrown on such issues as: changes in levels of academic preparation among entering students, trends in attrition and retention for students differentially prepared for college work, identification of entry variables associated with "dropping out" or continuing successfully at B.C.C., the rate and pattern of progress through the college for different groups of students.

This study had as its major purpose the generation of data and information which could be used by college officers and staff in making the changes in programs and services necessary to minimize student attrition (apart from transfers). The study was organized into three parts as follows:

A. comparisons between dropouts and stayins on a series of entry characteristics

B. comparisons among three groups of "differentially qualified" students

C. a follow-up survey of "dropouts"

Attrition-Retention Comparisons between Dropouts and Stayins

Procedure

At the beginning of the Spring semester of the 1970-71 school year, a list was prepared of students who enrolled at B.C.C. as freshmen in the Fall of 1970, but who did not return for the following, Spring semester. The number of students thus identified was 485, out of an entering class of 2,017 original registrants. The general evaluation design called for comparing this "drop-out" (D.O.) group with the group of students who did return (S.R.) on a wide range of entry and other variables. In order to sharpen the differences between the D.O. and S.R. groups, the names of students who dropped out with an index of 2.00 or more were deleted from the D.O. list. Also removed from the study were the names of students in such special programs as College Discovery.

Five analyses explored differences between the two basic groups: a) a t test analysis of differences between means b) a Chi Square analysis of differences between (among) ratios c) a multiple discriminant analysis d) a multiple regression analysis e) simple distributions of J (course drop) and F grades.

In methods b, c, and d, the entire groups of D.O. and S.R. students (restricted as describe above) provided the basis for analysis. For methods a and e the D.O. group was compared with a sample drawn from the S.R. population and matched on the basis of sex and curriculum. In the t test analysis the differences between group means were examined for the following nine entry variables which were also considered potential predictor variables:

3 Year High School Grand Average*

H.S. English Average

H.S. Mathematics Average

Years of H.S. Mathematics (through grade 12)

H.S. Science Average

Semesters Deficient in H.S. Language Study (for curriculum)

Semesters Deficient in H.S. Mathematics (for curriculum)

Semesters Deficient in H.S. Science (for curriculum)#

Nelson-Denny Reading Score

Separate t tests were computed for these nine entry variables for each of seven separate curriculum areas and for all curriculums combined. The curriculum areas examined were: liberal arts, nursing, business transfer, business careers, secretarial studies, electrical and mechanical technology, and engineering science.

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*All H.S. Averages are for grades 9-11.

#The analyses for "semesters deficient in H.S. Science" was eliminated because of insufficient data.

Results

Examination of the entry variable means for the two groups (D.O. and S.R.) revealed rather close agreement for most variables, across all curriculum groups. Only two entry variables were found to discriminate between the D.O. and S.R. groups, H.S. Mathematics Average and H.S. Mathematics Credits. Both of these discriminated between the DO and SR groups in the Liberal Arts curriculum, while only High School Mathematics Credits Earned discriminated between the two groups in the Secretarial Studies curriculum. No variables discriminated between the groups in the other curriculum areas.

Differences between the DO and SR groups for non continuous, that is, categorial data such as type of high school, regular vs. "open admissions" admission, chemistry and physics high school background, and remedial course placements, were carried out by Chi Square analyses for individual curriculum areas and across all combined. The students' high schools were classified into five groups (high academic public, middle academic public, low academic public, vocational technical public, private and parochial), according to a chart furnished by the New York City Board of Higher Education. Students were also calssified into 3 open admissions groups, as follows: O.A. Group 1, if they would have been rejected for admission to B.C.C. in the Fall of 1969 (last pre open admissions year) on the basis of an inadequate high school average; O.A. Group 2, if they would have been rejected because of subject-matter insufficiencies; and O.A. Group 3, if they would have met all Fall 1969 requirements for admission. Students in groups 1 and 2,

therefore, may be considered the "true" open admissions students. Students in O.A. Group 3 closely resemble the normally admitted students prior to Open Admissions.

The results indicate that for the Liberal Arts, Nursing, and Engineering Science curriculae and for all curriculum areas combined, there is a significant relationship between School Group and Drop-out Rate. For both Liberal Arts and Nursing, the major contributions to the significance of Chi Square appears to come from the tendency of vocational-technical high school graduates to have a higher drop out rate than students from the other school groups, and particularly with respect to students from Group 1, the high academic school group.

An example of these findings is seen in Table 1 which combines data from all curriculum groups. While the relationship between the Open Admissions Groups and Drop-out Rate misses significance, a trend may be discernible.

The expectation that a clearly higher proportion of students from Open Admissions Groups 1 and 2 would drop out than from Group 3, was not verified, although a trend in the expected direction was found for some of the curriculum areas (liberal arts, business transfer and careers).

With regard to high school background in science, an attempt was made to find out whether having chemistry, physics, both, or neither in high school was associated with dropping out of B.C.C. Most of these comparisons could not be made because of the extremely small numbers of students who had had chemistry or physics in high school. In the few comparisons which were possible no significant relationship could be discerned.

With regard to the relationship between B.C.C. remedial course placements and drop-out rate, group sizes were sufficiently large to permit valid statistical compariosns in the great majority of curriculum areas.

The somewhat surprising findings suggest that placement in the basic remedial courses at B.C.C. bears no significant relationship to the tendency to "drop out" from the college. Even taking the most extreme comparison, that between students who were assigned to remedial reading and remedial English on the one hand, and those assigned to neither, on the other, the proportions dropping out were found to be extremely close, for each curriculum area considered separately, and for all combined. Substantially similar observations were made for the comparison between students assigned and not assigned to remedial Mathematics. One inference which may be drawn therefore, is that placement into the basic remedial courses at this college does not carry with it an increased probability of dropping out, in comparison with non-placement into these courses.

Multivariate Analysis of the Data

The foregoing segment of the study limited each analysis to the examination of a single predictor variable at a time. In the next part of the study eight predictor variables (H.S. General Average, H.S. English Average, H.S. Math Average, Years of H.S. Math, Nelson-Denny Reading Score, High School Group, H.S. Science background, and H.S. Science Average) were considered simultaneously to define a "discriminant function" which maximally separates the D.O. and S.R. groups of students.

The questions answered by the analysis are: a) to what extent do the eight variables define separate groups of D.O. and S.R. students? and b) to what extent does each of the eight variables contribute to this separation of the groups?

The evidence suggests that when all entry variables are considered simultaneously, they do not significantly discriminate between the two criterion groups, for any curriculum area considered individually, or for all curriculum areas combined, although there appears to be somewhat better discriminability within each curriculum ~~are considered individually~~ than when all are combined. Although the interpretation is seriously clouded by the failure of the discriminant function to adequately separate dropout from returning students, some qualified verification for the relationship, previously reported, between high school mathematics average and drop-out rate within the Liberal Arts curriculum was seen.

For mainly academic reasons the same eight entry variables just described were subjected to a step-wise multiple regression analysis. This procedure selected, in order, the variables which add most to the predictive power of an equation linking the entry variables to membership in the D.O. or S.R. groups. It also computes the multiple correlation coefficient between the set of predictors and the criterion. This procedure was again applied to all curriculum areas separately and to all combined. The results showed that none of the multiple correlations were statistically significant. In the case of the business careers and the technology curriculae, the Multiple Rs (around .4) accounted for only 18% of the variance of the criterion (membership in the D.O. or S.R. group), and so for all practical purposes one may say that this analysis verifies the absence of meaningful

relationships between the entry variables, considered simultaneously, and membership in the D.O. or S.R. groups.

Summary and Conclusion

Perhaps the most important finding of this study is the apparent absence of clear or strong relationships between the entry variables considered, and the tendency to drop-out of this community college after one semester. This general conclusion is indicated despite the identification of a few very specific relationships, as those linking H.S. Mathematics (amount and proficiency) and the type of high school to the drop-out rate. Of particular importance may be the finding that the open-admissions student, that is, the student whose academic deficiencies would have excluded him from B.C.C. prior to open-admissions, does not show a significantly higher drop-out rate than the "fully qualified" student. Support for this direct finding is also seen in the absence of a relationship between placement in remedial courses and the tendency to drop out.

The failure to find "expected" relationships suggests two avenues for continued exploration of the attrition-retention problem. The first would recommend a replication of the present study covering an entire academic year. This would considerably enhance the size and purity of the drop-out groups. For example, many students who were in the S.R. group for this study, may have dropped out in the second semester. Their presence in the S.R. group, therefore, served to "contaminate" that group with D.O. group "characteristics".

A second possibility for further study would take a completely different direction, though it would not exclude the aforementioned replication study. The second line of approach stems from the experience at this and other colleges which shows that academic or scholastic entry variables alone display only low to modest relationships with college success. There is growing evidence that non-intellective, non-cognitive, non-scholastic factors such as achievement motivation, and demographic factors such as financial need and home conditions can facilitate considerably the identification of the potential drop-out. We believe that this approach should be explored, if a useful technique for the identification of students requiring help on entry into this community college is to be developed.

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Table 1. Chi Square Comparisons between Students Returning (S.R.) and Students Not Returning (D.O.) for the Spring, 1971 Semester, on proportions of D.O. and S.R. within Open Admissions and School Groups, for All Curriculums Combined.

Open Admissions Groups		N DO	N SR	Proportions Within Marginal Categories DO	Proportions Within Marginal Categories SR	Chi Sq.	Significance Level
(def. in average)	1	213	766	.22	.78		
(def. in credits)	2	80	312	.20	.80		
(regular)	3	55	290	.16	.84	5.31	n.s.
School Groups							
(high academic)	1	12	82	.13	.87		
(middle academic)	2	101	485	.17	.83		
(low academic)	3	58	253	.19	.81		
(voc. & tech.)	4	71	189	.27	.73		
(private and parochial)	5	105	368	.22	.78	16.18	$<.01$